

REMARKS/ARGUMENTS

This is in reply to the Office Action dated June 10, 2003 issued in connection with the above-captioned pending patent application, which action has been made **final**. This reply is being filed within the three-month shortened statutory period set for filing the response.

Claims 46-64 are pending. Independent claims 46, 51, 56, and 61 have been amended.

Applicants respectfully request that the above-requested amendments be entered, because the amendments add no new matter to the Application, add no new claims, raise no new issues, do not require further searching by the Examiner, address the issues raised by the Examiner, and place the Application in condition for allowance. Applicants also respectfully submit that the requested amendments are necessary to place the Application in condition for allowance, and were not earlier presented due to a failure on the part of the undersigned to appreciate the need for such amendments until receipt of the present Office Action.

I. Rejection Under 35 U.S.C. § 112

Claims 46-64 stand rejected under Section 112 for a variety of reasons, each of which is addressed below.

The Office Action first asserts that it is unclear how the "I-beam" structures disclosed in Figure 1, 2, and 3 are to be used in practice. Applicants respectfully disagree. A practical electrical connector embodying the structures illustrated in Figures 1-3 is shown in Figures 4-15 and described in the specification at pages 7-11. A practical transmission cable embodying the "I-beam" structure is illustrated in Figures 19 and 20 and described in the specification at pages 12-14. Reconsideration of this ground of rejection is respectfully requested.

The Office Action next asserts that for claims 48-54, no teaching of the structures shown in Figures 1-3 with "solder masses" is present. On the contrary, Figures 24-33 depict a practical electrical connector that embodies the "I-beam" structure illustrated in Figures 1-3 and that has solder masses secured to the signal conductors.

Next, the Office Action asserts that with respect to claims 46, 51, and 56, adequate support is not found in the specification for the details recited in the claims now presented. The Office Action further suggests that the figure presented on page 3 of Applicants last

reply would have to be added to the Application to support the claims. Applicants respectfully disagree. As discussed in Applicant's last reply, the portion of the specification at page 5, line 15 to page 6, line 5 describes the basic "I-beam" structure of the present invention and explains that two or more of the "I-beam" modules of Figure 1 can be placed side-by-side. One of ordinary skill in the art of electrical connector design would readily understand that placing two of the structures illustrated in Figure 1 side-by-side would result in the figure shown on page 3 of Applicants last response. Applicants submit, therefore, that the illustration in Figure 1 is sufficient to support the present claims. Moreover, to the extent that two or more "I-beam" modules may need to be illustrated in the figures, Applicants submit that Figure 3, as well as the practical connector embodiment shown in Figures 4-15, already provides an illustration of such side-by-side "I-beam" structures. Reconsideration of this ground of rejection is respectfully requested.

Finally, the Office Action objects to the use of the term "laterally spaced" to describe the side-by-side relationship between the first and second ground planes and the third and fourth ground planes. While Applicants submit that the term "laterally spaced" is appropriate to describe such a relationship, in the interests of advancing prosecution, Applicants have amended independent claims 46, 51, and 56 to recite that the first and second spaced-apart ground planes are "positioned to one side of" the third and fourth spaced-apart ground planes. Applicants submit that the amended language clearly and accurately describes the side-by-side relationship of the two sets of spaced-apart ground planes. Reconsideration of this ground of rejection is respectfully requested.

For all the foregoing reasons, Applicants respectfully submit that the amended claims satisfy the requirements of 35 U.S.C. § 112. Reconsideration of the Section 112 rejection of claims 46-64 is respectfully requested.

II. Rejections under 35 U.S.C. §§ 102 and 103

A. Claims 46-60

Claims 46, 47, 51, 52, 56, and 57 stand rejected under 35 U.S.C. § 102(a) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over, the Fedder reference. Claims 48-50, 53-55, and 62-64 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fedder in view of Seidler, Swamy, and Romine. Applicants

respectfully submit that Fedder and the other cited art fail to teach important aspects of the invention as recited in Applicants' claims.

According to the novel "I-beam" structure of the present invention, as recited in independent claims 46, 51, and 56, when two "I-beam" modules are placed side-by-side, "the space between said first and second conductors [is] occupied by air," and "a dielectric having a predetermined thickness [is] positioned between" the signal conductors and the respective ground planes. The length of the air gap between the first and second conductors and the predetermined dielectric thickness are selected to result in a virtual ground plane between the first and second conductors that minimizes cross-talk on the signal conductors. Thus, the invention relies on an air gap between signal conductors and a dielectric material positioned between the signal conductors and their respective ground planes, together with the relative dimensions of each, to control cross-talk on the signal conductors.

On the contrary, with reference to Figure 11 of Fedder, the connector illustrated in that reference places elongated air reservoirs 46 on either side of the ground plane 44 such that an air gap is formed *between the ground plane and the signal conductors 56*, not between adjacent signal conductors as claimed. Indeed, as shown in Figure 11, the space between adjacent signal conductors 56 of the Fedder connector is filled with the dielectric material of the connector body; that space is not occupied by air as claimed. As Fedder explains, "[t]he impedance of the connector assembly may be assuredly controlled by precisely defining the dimensions of the air reservoirs on each side of the ground contact member such that a desired proportion of dielectric material and air is achieved." Col. 2, ll. 5-9; *see also*, col. 2, ll. 10-22. Thus, Fedder attempts to reduce cross talk by controlling the width of an air gap between the signal conductors and the ground plane and providing a dielectric material between adjacent signal conductors. That is essentially the direct opposite of the approach taken by Applicants. As recited in independent claims 46, 51, and 56, Applicants have reduced cross-talk by controlling the width of a dielectric material between the signal conductors and the ground planes and by providing an air gap between adjacent signal conductors.

In view of the significant differences between the structure recited in independent claims 46, 51, and 56 and the structure disclosed in the Fedder reference (which reflects the opposite approaches each has taken to control impedance and reduce cross-talk), Applicants

submit that the Fedder reference neither anticipates nor renders obvious the subject matter of those claims. Inasmuch as claims 47-50, 52-55, and 57-60 depend either directly or indirectly from one of independent claims 46, 51, or 56, Applicants respectfully submit that they too patentably define over the cited art for the same reasons. Particularly with respect to claims 48-50, 53-55, and 58-60, neither Fedder, Swamy, Seidler, nor Romaine, alone or in combination, teaches or suggests combining the novel "I-beam" structure of the present invention with the use of solder masses in the manner recited in those claims.

For all the foregoing reasons, therefore, Applicants respectfully submit that claims 46-60 are allowable over the art of record. Reconsideration of the Section 102/103 rejections of those claims is respectfully requested.

B. Claims 61-64

Claim 61 stands rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious in view of, the Fedder reference. Claims 62-64 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fedder in view of Seidler, Swamy, and Romine. Reconsideration is respectfully requested.

Applicants have amended independent claim 61 to recite the following features:

a first dielectric positioned *between the first ground and the first of the second sides* and a second dielectric positioned *between the second ground conductor and the second of said second sides*,

the signal conductor, first and second ground conductors, and first and second dielectrics forming a module having a height defined by said first length of the signal conductor and a thickness of the first and second ground conductors and first and second dielectrics and a width defined by a width of the first and second dielectrics, *wherein the ratio of the height of the module to the width of the module is approximately unity*.

Claim 61 (as amended) (emphasis added). Thus, the claim recites that a dielectric is positioned between the ground planes and the signal conductors and that the aspect ratio of the individual "I-beam" module formed by the recited structure is approximately unity. Support for this claim is provided in the specification at page 5, line 15 to page 6, line 5 ("The aspect ratio to minimize coupling beyond [boundaries] A and B is approximately unity as illustrated in Figure 1.").

Fedder does not teach or suggest either of these features of the invention. As explained above, Fedder places an air reservoir between the ground planes and the signal

conductors to control impedance, as opposed to the recited dielectric. Additionally, Fedder does not teach or suggest that the ratio of the height to width of the module formed by each individual signal conductor, dielectric layer, and ground plane is approximately unity.

Because Fedder does not teach or suggest the foregoing features recited in independent claim 61, Applicants respectfully submit that claim 61 patentably defines over Fedder and any of the other cited art, alone or in combination. Inasmuch as claims 62-64 depend either directly or indirectly from independent claim 61, Applicants respectfully submit that they too patentably define over the cited art for the same reasons. Moreover, neither Fedder, Swamy, Seidler, nor Romaine, alone or in combination, teaches or suggests combining the novel "I-beam" structure of the present invention with the use of solder masses in the manner recited in those claims.

For all the foregoing reasons, therefore, Applicants respectfully submit that claims 46-60 are allowable over the art of record. Reconsideration of the Section 102/103 rejections of those claims is respectfully requested.

CONCLUSION

For all the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance. Reconsideration of the Office Action and an early notice of allowance are respectfully requested.

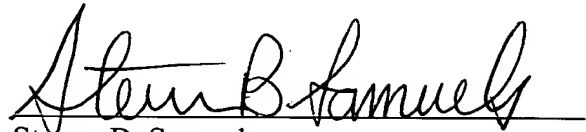
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Respectfully submitted,

A handwritten signature in black ink, appearing to read "Steven B. Samuels", written over a horizontal line.

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